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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|----------------------|------------------|
| 10/692,696 | 10/24/2003 | Nick Lindert | ITL.1063US (P18030) | 9799 |
| 21906 | 7590 | 09/16/2005 | EXAMINER | |
| TROP PRUNER & HU, PC 8554 KATY FREEWAY SUITE 100 HOUSTON, TX 77024 | | | NGUYEN, CUONG QUANG | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2811 | |

DATE MAILED: 09/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-----------------|----------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/692,696 | LINDERT ET AL. | |
| | Examiner | Art Unit | |
| | Cuong Q. Nguyen | 2811 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12 and 20-25 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Furukawa et al. (US 5,998,835).

Regarding claim 1, Furukawa et al. discloses a method comprising: forming a metal oxide semiconductor field effect transistor having an epitaxially deposited source/drain (210, 220) that extends under the edges of a gate electrode. See Fig.2 and col.2 lines 2-6.

Regarding claim 2, as shown in Furukawa's Fig.2, the method including forming a source/drain extension that extends under the edges of a gate electrode.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Lustg et al. (US 6,150,815).

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Regarding claim 1, Lustig et al. discloses a method comprising: forming a metal oxide semiconductor field effect transistor having an epitaxially deposited source/drain (18) that extends under the edges of a gate electrode. See Fig.5-6 and col.5 lines 1-18.

Regarding claim 2, as shown in Furukawa's Fig.2, Lustig et al. teaches that a source/drain extension that extends under the edges of a gate electrode. col.5 lines 1-18.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4, 5, 7-11, and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lustig et al. in view of Taniguchi (US 5,384,497).

Regarding claims 3 and 4, Taniguchi teaches all the limitations of claims 1 and 2 as shown above but does not explicitly teach that an epitaxially deposited over a substrate. Wherein the gate electrode formed over the epitaxially deposited material layer.

Taniguchi established that it is conventional to form an P epitaxially deposited silicon layer (11) on a P⁺ silicon substrate (10) and the forming a gate electrode on the epitaxially deposited silicon layer (11) in MOS transistor. See Fig.1 and col.1 lines 20-25.

Therefore, It would have been obvious to one of ordinary skill in the art to provide conventional suvbstrate including an epitaxially deposited silicon layer on a silicon substrate as taught by taniguchi into Lustig et al.'s device.

Regarding claims 1, 5, 12, 20, it is noted that the device being formed by the combination of Lustig et al. and Taniguchi has an upper surface of epitaxially deposited layer formed over the substrate which is identical as Fig.1 of present invention so it is considered as a delta doped transistor. It is noted that an upper surface of epitaxially deposited layer formed over the substrat is selectively etched.

Regarding claims 7-9, 21, as shown in Lustig et al.'s Fig.5-6, a sidewall spacer (81) formed on the gate electrode and etching under the sidewall spacer so as to undercut the gate electrode.

Regarding claim 10, Lustig et al. teaches that the epitaxial material is silicon doped material. See Col.5 lines 15-20.

Regarding claims 11, 22, Lustig et al. teaches that the cut extending under the gate electrode (col.5 lines 4-6) so that the epitaxial material (18) is inherently thinner near (under) gate electrode and thicker spaced from the gate electrode.

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Regarding claims 23 and 25, the thinner portion of epitaxial material is considered as a first thickness under the gate electrode and the thicker portion is considered as a second thickness space from the gate electrode wherein the second thickness is in alignment with the spacer.

Regarding claim 24, as shown in Lustig et al.'s Fig.5-6, a deep source/drain region (13) is formed by ion implantation. See col.4 lines 35-40.

Allowable Subject Matter

3. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
4. The following is an examiner's statement of reasons for allowance: above combination appears to be the closest prior art reference. However, this combination fails to teach using sonication to selectively etch the material. Prior art of record fails to teach or suggest to incorporate these limitations into above references to arrive at the claimed device.

Conclusion

5. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15,

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1989). The Group 2811 Fax Center number is (703) 872-9306. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

6. Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to CUONG Q NGUYEN whose telephone number is (571) 272-1661. The Examiner is in the Office generally between the hours of 6:30 AM to 5:00 PM (Eastern Standard Time) Monday through Thursday.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner Swteven Ioke who can be reached on (571) 272-1657.

A handwritten signature in black ink, appearing to read 'Cuong Nguyen', with a stylized, cursive script.

Cuong Nguyen

Primary examiner

9/9/05